

Remarks

Applicants respectfully request reconsideration of the present application in view of the above amendments and following remarks. Claims 13 and 14 have been amended and claims 11 and 12 have been cancelled. Claims 15-24 have been withdrawn and no claims have been added. Therefore, claims 1-10, 13 and 14 are pending in the present application.

Claim 1 has been rejected under 35 U.S.C. § 102 as being anticipated by EP 1,047,144 to Botti et al and U.S. Patent No. 6,609,582 to Botti et al. Since the content of both of these references are substantial duplicates of one another, they will collectively be referred to as the Botti reference. Applicants respectfully traverse this rejection.

Claim 1 is directed to a method of main reformer startup. The method includes introducing a first supply of fuel and a first supply of air into a micro-reformer, increasing the first supply of fuel to produce a heated reformat in the micro-reformer, directing the heated reformat through a main reformer to heat the main reformer, burning at least a portion of the heated reformat in the main reformer, and introducing a second supply of fuel and a second supply of air to the main reformer to produce a main supply of reformat.

In order for a prior art reference to anticipate a claim, the reference must disclose each and every element of the claim with sufficient clarity to prove its existence in the prior art. See *Motorola, Inc. v. Interdigital Tech. Corp.*, 43 USPQ.2d 1481, 1490 (Fed. Cir. 1997). Although the disclosure requirement presupposes the knowledge of one skilled in the art of the claimed invention, that presumed

knowledge does not grant a license to read into the prior art reference teachings that are not there. *See id.* "[W]hen an examiner relies on inherency, it is incumbent on the examiner to point to the "page and line" of the prior art which justifies an inherency theory." *Ex parte Schricker*, 56 USPQ.2d 1723, 1725 (B.P.A.I. 2000) (unpublished) (stating that the examiner left the Board to guess at which part of the prior art document supports the rejection).

The Bottie reference does not teach or suggest a method including increasing the first supply of fuel to produce a heated reformat in the micro-reformer as recited in claim 1. In rejecting claim 1, the Examiner stated that "the [Botti] reference does not explicitly disclose increasing said first supply of fuel to produce a heated reformat, said step is inherent in the method of Botti." *Office Action*, pg. 4. As best seen in FIG. 1 of the Bottie reference, fuel (11) is provided to the start-up reformer (10) from supply (9). *See Bottie*, Col. 4, lines 58-62. However, the Examiner fails to point out which portion of the Botti supports the fact that it is inherent to increase the supply of fuel to the start-up reformer (10) after the supply (9) provides a first supply of fuel to the start-up reformer (10). After the first supply of fuel is provided to the start-up reformer (10), the fuel supply could be constant until the start-up reformer (10) is turned off. *See Botti*, Col. 5, lines 14-15. Given the Examiner's failure to provide any evidence to support the position that the Bottie reference inherently discloses increasing the first supply of fuel to produce a heated reformat in the micro-reformer, as recited in claim 1, Applicants request that the rejection of claim 1 be withdrawn.

Claims 4 and 6-14 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Botti reference. Claims 11 and 12 have been cancelled, therefore the rejection to these claims is moot. Applicants respectfully traverse the rejection to the remaining claims.

As stated above, the Botti reference does not teach or suggest a method including increasing the first supply of fuel to produce a heated reformat in the micro-reformer as recited in claim 1. Since claims 4, 6-10, 13 and 14 depend from claim 1, these claims are not taught or suggested for at least the same reason set forth above with respect to claim 1.

Even when obviousness is based on a single prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference. *See In re Kotzab*, 55 USPQ.2d 1313, 1316-17 (Fed. Cir. 2000). Further, rejections based on 35 U.S.C. § 103(a) must rest on a factual basis. In making such a rejection, the Examiner has the initial duty of supplying the requisite factual basis and may not, because of doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. *In re Warner*, 154 USPQ 173, 178 (CCPA 1967). The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification. *See In re Mills*, 16 USPQ.2d 1430, 1432 (Fed. Cir. 1990).

In rejecting claims 4, 13 and 14, the Examiner recognizes that the Botti reference does not disclose specific catalyst volumes for the micro-reformer relative

to the main reformer, but states that FIG. 1 of the Botti reference shows the start-up reformer (10) being significantly smaller than the main reformer. *See Office Action*, pg. 5. Applicants submit that comparing the size of the start-up reformer (10) and the main reformer from FIG. 1 does not suggest the relative catalyst sizes.

Specifically, the main reformer illustrated in FIG. 1 of the Botti reference is shown as being incorporated within an engine (30), wherein the engine may be a gas turbine engine, spark ignited and compression ignited engines. *See Botti*, Col. 9, lines 57-62. Therefore, the main reformer is just one component included within the engine labeled as referenced numeral 30. There is nothing in FIG. 1 of the Botti reference to show the size of the main reformer relative to the start-up reformer (10).

Furthermore, the Examiner stated that one skilled in the art would have optimized the catalyst volumes in the start-up reformer relative to the main reformer in the Botti reference since the general conditions of the claims are disclosed in the Botti reference. *See Office Action*, pg. 5. Applicants submit that the conditions present in the Botti reference are not the same as in the present invention. In the Botti reference, the start-up reformer (10) provides reformat to the engine (30) so that the engine can produce shaft power, while the hydrogen rich engine exhaust (50) or reformer exhaust (20) is used as fuel for the fuel cell (40). *See Botti*, Col. 4, lines 58-62; Col. 5, lines 1-15; Col. 9, lines 53-57. In contrast, the reformat produced by the micro-reformer is directed to the main reformer to heat the main reformer, and at least a portion of the reformat is burned in the main reformer. The micro-reformer of the present invention does not provide reformat to produce shaft power in an engine, therefore the relative demands on the micro-reformer in the

present invention compared to the start-up reformer in the Botti reference may result in a catalyst ratio that fall outside the ranges disclosed in claims 4, 13 and 14. Thus, there is nothing in the Botti reference to teach or suggest that the catalyst volumes of the start-up reformer (10) and the main reformer in the Botti reference fall within the claimed ranges set forth in claims 4, 13 and 14. For this additional reason, Applicants request that the rejection of claims 4, 13 and 14 be withdrawn.

In rejecting claims 6, 7 and 9, the Examiner stated that the fuel equivalence ratios are not considered to confer patentability to the claims because the ratios are a result effective variable that could be determined by one skilled in the art give the fact that the general conditions of the present invention are disclosed in the Botti reference. *See Office Action*, pg. 6. As stated above, the conditions in the present invention are not disclosed in the Botti reference. In the Botti reference, the start-up reformer (10) provides reformat to the engine (30) so that the engine can produce shaft power, while the hydrogen rich engine exhaust (50) or reformer exhaust (20) is used as fuel for the fuel cell (40). *See Botti*, Col. 4, lines 58-62; Col. 5, lines 1-15; Col. 9, lines 53-57. In contrast, the reformat produced by the micro-reformer is directed to the main reformer to heat the main reformer, and at least a portion of the reformat is burned in the main reformer. The micro-reformer of the present invention does not provide reformat to produce shaft power in an engine.

Therefore, the relative fuel equivalence ratios for the micro-reformer in the present invention compared to the start-up reformer in the Botti reference may be different since the micro-reformer in the present invention does not have to supply fuel to an engine to produce shaft power.

By increasing the flow rate in the micro-reformer, and adding air and then a fuel in the main reformer, in accordance with the claimed equivalence ratios, the system produces a high flow rate of reformat within a short period of time. See *Specification*, pg. 9, lines 28-30. Moreover, the method operates to maintain the main reformer at a standby temperature so that hydrogen and carbon monoxide will aggressively react upon startup. See *Specification*, pg. 9, lines 19-30. Given that no evidence has been provided to show that the Botti reference teaches or suggests the equivalence ratios disclosed in claims 6, 7 and 9 of the present invention, Applicants request that the rejection of these claims be withdrawn.

Claims 2, 3 and 11 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Botti reference in further view of U.S. Patent No. 4,391,794 to Silberring ("the Silberring reference"). Claim 11 has been cancelled, therefore the rejection of this claim is moot.

The Silberring reference fails to add anything to the Botti reference except to provide a reforming apparatus having a recuperator, a reactor chamber and a heater disposed in a common pressure shell. See *Silberring*, Abstract. As with the Botti reference, the Silberring reference fails to teach or suggest a method including increasing the first supply of fuel to produce a heated reformat in the micro-reformer as recited in claim 1. As claims 2 and 3 depend from claim 1, these claims are also not taught or suggested by the references of record for at least the same reasons set forth with respect to claim 1.

Claim 5 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Botti reference in further view of U.S. Patent No. 5,858,314 to Hsu ("the Hsu reference").

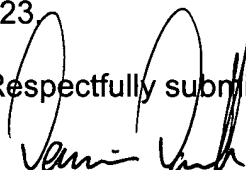
The Hsu reference fails to add anything to the Botti reference except to provide a reformer having a stack of thermally conducting plates interspersed with catalyst plates. See *Hsu*, Abstract. As with the Botti reference, the Hsu reference fails to teach or suggest a method including increasing the first supply of fuel to produce a heated reformat in the micro-reformer as recited in claim 1. Since claim 5 depends from claim 1, this claim is also not taught or suggested by the references of record for at least the same reasons set forth with respect to claim 1.

Conclusion

In light of the foregoing, Applicants submit that claims 1-10, 13 and 14 are in condition for allowance and such allowance is respectfully requested. Should the Examiner feel that any unresolved issues remain in this case, the undersigned may be contacted at the telephone number listed below to arrange for an issue resolving conference.

Applicants hereby authorize the Commissioner to charge the \$180.00 surcharge required under 37 C.F.R. § 1.17(p), and any other fee that may have been overlooked, to Deposit Account No. 10-0223.

Dated: 4/11/05

Respectfully submitted,


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Claim 5 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Botti reference in further view of U.S. Patent No. 5,858,314 to Hsu ("the Hsu reference").

The Hsu reference fails to add anything to the Botti reference except to provide a reformer having a stack of thermally conducting plates interspersed with catalyst plates. *See Hsu*, Abstract. As with the Botti reference, the Hsu reference fails to teach or suggest a method including increasing the first supply of fuel to produce a heated reformat in the micro-reformer as recited in claim 1. Since claim 5 depends from claim 1, this claim is also not taught or suggested by the references of record for at least the same reasons set forth with respect to claim 1.

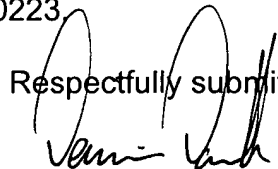
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